

Patent Claims

1. A switching gas damper (1; 31; 61; 101) for low-voltage power breakers (2; 62), which is arranged as an attachment above the arcing chambers (6, 7, 8; 66, 67, 68) for additional damping, deionization and cooling of the switching gases, with the attachment having a cuboid enclosure with a front wall (10; 40; 70; 110), a rear wall (11; 41; 71; 111) and a cover (9; 39; 69; 109),
characterized
in that the cover (9; 39; 69; 109) is designed to be closed and a bottom (14; 44; 74; 114) having separate inlet openings (87; 89; 91; 107; 108) is provided for receiving switching gas flows (3-5; 33-35; 63-65; 103-105) from each arcing chamber (6, 7, 8; 66, 67, 68) in the low-voltage power breaker (2; 62), and in that each inlet opening (87; 89; 91; 107; 108) has an associated outlet channel (17, 21, 23; 47, 51, 53; 79, 84 86; 117, 121, 123), which is formed by channel walls (16, 20; 46, 50) and/or deflection elements (15, 19; 45, 49; 75, 76; 115, 119; 126, 127), in order to dissipate the switching gas flows (3-5; 33-35; 63-65; 103-105) at the sides.
2. The switching gas damper as claimed in claim 1, characterized
in that, in a three-pole low-voltage power breaker (2; 62), a channel wall (20) is arranged parallel to the front wall (10) and a further channel wall (16) is arranged parallel to the rear wall (11), thus, in conjunction with deflection elements (15, 19; 45, 49), forming a total of three outlet channels (17, 21, 23), of which the outer outlet channels (17, 21), which are bounded by the front wall (19) and by the rear wall (11), are closed on opposite sides by a side wall (12 or 13 respectively), and the central outlet channel (23), which is

bounded by the channel walls (16, 20), is open on both sides, such that the switching gas flows (3, 5; 33, 35) which emerge from the outer arcing chambers (6, 8) of the low-voltage power breaker (2) are carried away separately on opposite sides, while the switching gas flow (4; 34) which emerges from the central arcing chamber (7) passes from the switching gas damper (1) to free space on both sides through the central outlet channel. (Figures 1, 2)

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3. The switching gas damper as claimed in claim 2, characterized

in that the channel walls (16, 20; 46, 50) extend from the bottom (14; 44) to the cover (9; 39) of the switching gas damper (1; 31), and in that the side walls (12, 13; 42, 43) are arranged on the same side of the switching gas damper (1; 31) as the outer arcing chambers (6, 8), such that the switching gas flows (3, 5; 33, 35) of the outer arcing chambers (6, 8) are passed, parallel to the front wall (10; 40) and to the rear wall (11; 41) of the switching gas damper (1; 31), to the respectively opposite side of the low-voltage power breaker (2), and the switching gas flow (4; 34) of the central arcing chamber (7) is passed to the two opposite sides. (Figures 1, 2)

4. The switching gas damper as claimed in claim 2 or 3, characterized

in that one deflection element (15, 19; 45, 49) is in each case arranged such that it extends above the inlet openings which are associated with the outer arcing chambers (6, 8) in the bottom (14) of the switching gas damper (19) and between the channel walls (16, 20; 47, 50), and in that a side part (28; 56) is in each case arranged on the mutually facing sides of the deflection elements (15, 19; 45, 49) in order to separate the switching gas flows (3, 5)

of the outer poles and the switching gas flow (4) of the central pole. (Figures 1, 2)

5. The switching gas damper as claimed in claim 4,
5 characterized
in that the first deflection element (15) extends, starting from the bottom (14) on the first channel wall (20), as far as the cover (9), and ending on the opposite channel wall (15), and the further deflection
10 element (19) is arranged such that it rises in the opposite direction between the channel walls (16, 20), with the side parts (28) having a shape which is matched to the rising arrangement of the deflection elements (15, 19), so as to separate the switching gas
15 flows (3, 5) of the outer arcing chambers (6, 8) and of the central arcing chamber (7). (Figure 1)

6. The switching gas damper as claimed in claim 4,
characterized
20 in that the deflection elements (45, 49) are arranged parallel to the cover (39) and to the bottom (44) above the inlet openings for guiding the switching gas flows (3, 5) of the outer arcing chambers (6, 8) and extend from one channel wall (46) to the other channel wall
25 (50), and side parts (56) are arranged on the mutually facing sides of the deflection elements (45, 49) in order to separate the switching gas flows (3; 5) of the outer arcing chambers (6, 8) and the switching gas flow (4) of the central arcing chamber (7). (Figure 2)

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7. The switching gas damper as claimed in claim 6,
characterized
in that the deflection elements (45, 49) are arranged
at any desired height position between the cover (39)
35 and the bottom (44) of the switching gas damper (31).
(Figure 2)

8. The switching gas damper as claimed in claim 6, characterized

in that the deflection elements (45, 49) are arranged at a height of $2/3$ of the height of the switching gas damper (31) away from the bottom (44) of the switching gas damper (31), and are arranged parallel to the bottom (44) and to the cover (39). (Figure 2)

9. The switching gas damper as claimed in claim 1, characterized

in that the deflection elements (75, 76; 115, 119; 126, 127) are at the same time in the form of channel walls and are arranged such that the switching gas flows (63, 65; 103, 105) which emerge from the arcing chambers (66, 68) of the outer poles of the low-voltage power breaker (62) are carried away from the switching gas damper (61; 101) directly at the sides, that is to say each on the same side of the low-voltage power breaker (62), and the switching gas flow (64; 104) which emerges from the central arcing chamber (67) is carried via or alongside the deflection elements (75, 76; 115, 119; 126, 127) to both opposite sides of the switching gas damper (61; 101). (Figures 3, 4, 5, 6)

10. The switching gas damper as claimed in claim 9, characterized

in that the deflection elements (75, 76) are arranged such that they extend from the bottom (74) to the cover (69) of the switching gas damper (61). (Figures 3, 4)

11. The switching gas damper as claimed in claim 10, characterized

in that the deflection elements (75, 76) are arranged such that, originating from the front wall (70) of the switching gas damper (61), they run between the inlet openings (87, 91 and 91, 89 respectively), which are

located above the arcing chambers (66, 67, 68), in the
direction of the rear wall (71),

are then angled, and each run behind the inlet openings (87, 89) for the switching gases from the outer arcing chambers (66, 68) as far as the side boundary of the switching gas damper (61), in such a manner that an outlet channel (79) is formed, which is coupled to the space above the central arcing chamber (67) of the low-voltage power breaker (62) and is open on both sides of the switching gas damper (61), for the switching gas flow (64) of this central arcing chamber (67). (Figures 3, 4).

12. The switching gas damper as claimed in claim 11, characterized in that the angles of the deflection elements (75, 76) are rounded. (Figures 3, 4)

13. The switching gas damper as claimed in claim 9, characterized in that the deflection elements (115; 119; 126; 127) are arranged such that they extend between the front wall (110) and the rear wall (111) such that one outlet channel (117; 121) for an outer arcing chamber is in each case bounded by the bottom (114) and a deflection element (115; 119; 126; 127) and an outlet channel (123), which is open on both sides and is connected to the central inlet opening (109) in the bottom (114), is formed for the central arcing chamber between the deflection elements (115; 119; 126; 127) and the cover (109). (Figures 5, 6)

14. The switching gas damper as claimed in one of the preceding claims, characterized

in that a direction-changing enclosure (26) with a guide chamber (27) is attached to the side of the switching gas damper (1; 31; 61; 101), on one or both sides of the switching gas damper (1; 31; 61; 101), in order to carry the switching gas flows (3-5; 33-35; 63-65; 103-105) which emerge from the switching gas damper (1; 31; 61; 101) at the side of the low-voltage power breaker (2; 62) away downward. (Figure 1)

10 15. The switching gas damper as claimed in claim 12, characterized in that the direction-changing enclosure (26) is angled. (Figure 1)

15 16. The switching gas damper as claimed in one of the preceding claims, characterized in that the cover (69) of the switching gas damper (61) is lengthened beyond its side boundary, and is provided
20 with guide elements pointing downward.

17. The switching gas damper as claimed in claim 16, characterized in that the guide elements are formed by elongations
25 (128), which extend downward at the sides along the low-voltage power breaker (62), of the side walls (72, 73) of the switching gas damper (61). (Figure 3)